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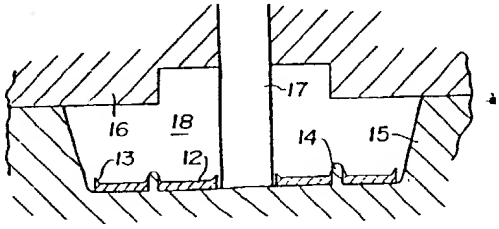
(54) Process for producing magnetic hub.

(57) A process for producing a magnetic hub for an optical disc to be fixed in use to the spindle of a disc drive by means of a magnetic clamp system, which process comprises positioning and setting an annular metal plate (12) composed of a ferromagnetic substance in a mold (15) and then injecting a resin into the mold (15).

FIG. 1



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and mold release can be easily carried out.

The positioning of the metal plate 12 in a mold can be made, for example, in the following manners:

(1)when the inner diameter of the hub 20 is equal to that of the metal plate 12, the metal plate 12 is fitted into the center pin 17 in the mold;

(2)when the outer diameter of the hub 20 is equal to that of the metal plate 12, the metal plate 12 is fitted into the recess of the mold 15 and 16, said recess forming a cavity 18, that is, the positioning is made by the inner and outer peripheries of the recess in the mold 15 and 16;

(3)when the inner and outer diameters of the hub 20 are equal to those of the metal plate 12, the positioning is made by the center pin 7 and the inner periphery of the recess;

(4)when the inner diameter of the metal plate 12 is larger than that of the hub 20 and the outer diameter of the metal plate 12 is smaller than that of the hub 20, a plurality of positioning pins 14 are provided in the mold15 and each of the pins 14 is inserted into each of a plurality of small holes (for positioning) formed on the metal plate 12; and

(5) the above method (4) is combined with any of the above methods (1) to (3).

Among them, the method (4) is preferred, because the positioning does not require so severe accuracy and burr may be formed in perforating the metal plate 12 to form small holes for positioning.

It is desirable that notches 9 are formed on the outer periphery of the metal plate 12 as shown in Fig.2, because the metal plate 12 can be firmly fixed to the resin body 19. Fig.3 shows an embodiment wherein a metal plate 12 having small holes 10 for positioning is provided with the notches 9.

Any of vertical and horizontal molds can be used. However, the vertical type is preferred, because the metal plate 12 can be easily fixed and is hardly slipped or displaced.

EMBODIMENT

A metal plate having a thickness of 0.3 mm is punched from a ferromagnetic substance to obtain an annular metal plate 12 having an axle hole 11 at the central part thereof, notches 9 on the periphery thereof, small holes 10 for positioning between notches 9 and burr 13 as formed, said burr 13 being formed on the periphery of each of the holes 10 and 11 and the notches 9,,as shown in Fig.3. Setting is made in the following manner. The small holes 10 are allowed to align with the positioning pins 14 on the mold 15 and the pins 14 are inserted into the holes 10 in such a manner that the burr 13 was positioned upward, as shown in Fig.1. The opposite mold 16 is then put thereon and clamped by conventional means. In the embodiment shown by the drawing, a mold 16 is provided with a center pin 17, but the mold 15 may be provided with the center pin 17. If desired, the center pin 17 may be protruded from both the molds 15 and 16. A resin is then introduced into a cavity 18 by a injection method. Any of thermoplastic resins and thermosetting resins can be used, so long as they can be injection-molded. Fig.5 shows a magnetic hub 20 obtained by the injection molding described above.

The magnetic hub 20 can be fixed to a disc substrate by any of conventional methods such as bonding, welding, ultrasonic welding, etc,. A magnetic hub having a long boss to be fitted in the axle of the disc substrate may be used. When such long bosses are abutted against each other and bonded to each other to join them, there is an advantage that the hub can be fixed much firmly.

The present invention has such advantages that the structure of the hub 20 is simple, the production of the metal plate 12 does not require so severe accuracy, the hub 20 can be fixed without perforating the disc substrate and the manufacturing cost of the hub 20 is low, as compared with the conventional method in which the metal plate provided with connecting rods is fixed to the perforated disc substrate

Claims

1. A process for producing a magnetic hub for an optical disc to be fixed in use to the spindle of a disc drive by means of a magnet clamp system, which process comprises positioning and setting an annular metal plate composed of a ferromagnetic substance in a mold and then injecting a resin into the mold.

2. A process according to claim 1, wherein there is used a burred annular metal plate which has been obtained by punching.

3. A process according to claim 1 or 2, wherein the outer diameter of the metal plate is smaller than that of the hub, the inner diameter of the metal plate is larger than that of the hub, the metal plate is provided with positioning holes, and the metal plate is positioned in the mold by fitting said positioning holes over positioning pins provided on the mold.

4. A process according to claim 1, 2 or 3 wherein notches are formed on the periphery of said metal plate.

5. An optical disc comprising disc substrates provided with a magnetic hub prepared by a process as claimed in any one of the preceding claims.

FIG.5

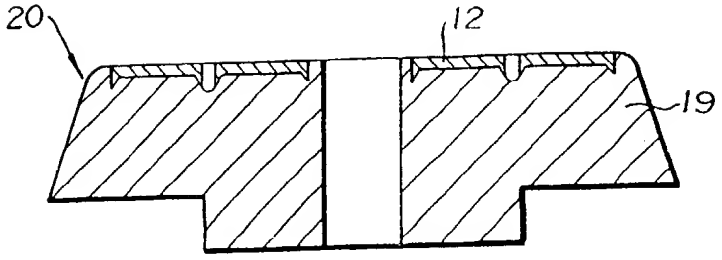


FIG.6

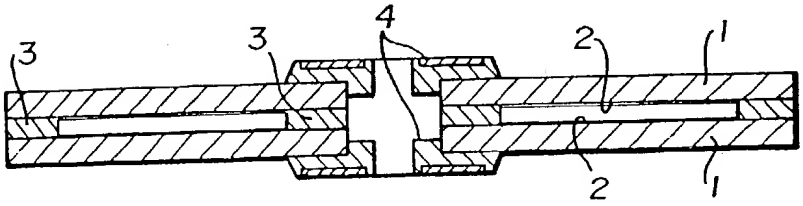
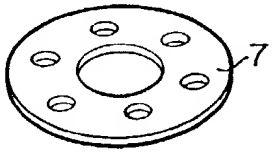
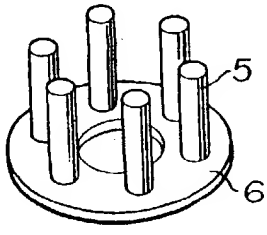


FIG.7





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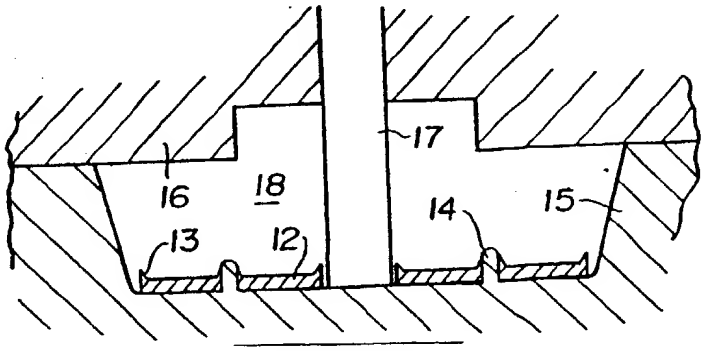

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